

ABSTRACT OF THE DISCLOSURE

A projectile navigation system operable within an extremely high G-shock loading environment during the launch phase may include a set of Kalman filters configured to repeatedly calculate a navigational solution by solving a set of non-linear equations of motions of the projectile utilizing a current parameter vector, position, velocity, and attitude of the projectile. The system may include a suite of solid state sensors to calibrate the Kalman filter equations. If desired, the system may also include a satellite based positioning-determining (SBPD) attitude determination system configured to update the state of the host projectile by making real time attitude measurements of the projectile, and a parameter estimator configured to estimate and update a parameter vector of the host projectile. An external guidance and control processor may be used to generate guidance and control signals, enabling real time navigation of the host projectile.